

CHILD RESISTANT CAP**BACKGROUND OF THE INVENTION****1. Field of the Invention**

The invention is directed to a child-resistant cap and container and, more particularly, to a child-resistant cap and container having a flexible tab formed in a bottom portion of an outer skirt and a tooth affixed at the neck of a bottle for edgewise locking engagement with the tab.

2. Description of the Prior Art

Numerous child-resistant mechanisms for preventing access to containers storing dangerous substances such as medicine, household cleaners, poisons or the like are known. Most, however, are complicated in design which drives up the cost of manufacturing the caps and containers. Also, typical child-resistant containers are often difficult to open as they require a user to exert an appreciable amount of force while simultaneously engaging in a sequence of complex manipulative movements to release the cap closure mechanism. For these reasons, many child-resistant mechanisms are unsuitable for physically feeble persons such as the elderly and the sick.

For example, U.S. Pat. Nos. 3,989,152 and 4,149,646 to Julian disclose a child-resistant cap having a tab provided in the bottom of the skirt of the cap, and a container having an abutment disposed at the neck of the container for locking engagement with the tab. A user is required to squeeze or flex the entire skirt while twisting the cap off so as to deflect the tab radially inwardly and around the abutment at the container neck. Such squeezing action would require an appreciable amount of force which may not be available to a physically feeble user.

Another example, U.S. Pat. No. 4,413,742 to Sandhaus discloses a cap having a tab that is frictionally receivable in a recess defined in the neck of the container. To remove the cap, the user is required to push out the hinged tab by, for example, depressing the top of the cap. To reinstall the cap over the container, the user must thread the cap onto the container neck and realign the tab with the recess in the neck.

In still another example, U.S. Pat. No. 4,752,014 to House et al. discloses a child-resistant closure having a ratchet type mechanism. The cap includes a flexible tab notched in the depending skirt of the cap. The tab is movable in the radially outward direction and has a pawl extending from a bottom surface of the tab. A plurality of recesses are formed at the neck of the container for receiving the pawl. Thus, as a user threads the cap onto the container neck, the pawl is brought into ratchet engagement with the recesses in the neck. To open the container, a user is required to pivot the tab and the pawl radially outwardly so as to remove the pawl from the recess received therein. This ratchet type mechanism is complex in design and expensive to manufacture. Furthermore, this design does not provide the requisite positive locking unless the user screws the cap on with adequate force so that the pawl is sufficiently received in one of recesses.

Other child-resistant closures with tab-actuated mechanisms are disclosed in U.S. Pat. No. 5,449,077 to Seidler, U.S. Pat. No. 5,460,281 to Rapchak et al., and U.S. Pat. No. 4,752,013 to Miller et al.

OBJECTS AND SUMMARY OF THE INVENTION

An object of the invention is to provide a low-cost child-resistant cap and container that is easily operated by a physically feeble person.

Another object of the invention is to provide a cap having concentric inner and outer skirts, the outer skirt having a radially deflectable tab formed by and between a pair of longitudinal slots in the bottom portion of the outer skirt for edgewise locking engagement with a tooth affixed proximate the neck of a container.

Still another object of the invention is to provide a child resistant cap with a locking mechanism which gives off an audible sound when the cap is rotated into a proper locking position.

In accordance with a preferred embodiment of the present invention, these and other objects are attained by providing a combined child-resistant cap and container. The container has an externally threaded neck portion defining an opening. The container includes a tooth affixed at a radial distance from the neck portion and projecting axially toward the opening. The cap has a top wall and an inner and outer skirt depending from the top wall of the cap. The inner skirt is concentric with and spaced inward of the outer skirt and has a threaded surface complementary to and engageable with the threaded neck portion of the container to permit rotation of the cap into a locked position. The outer skirt includes a flexible tab formed by and between a first and a second longitudinal slot provided in a bottom portion of the outer skirt. The flexible tab is movable radially between a normal position and a radially inwardly deflected position. The tab is spaced from said neck portion at substantially that radial distance so that when the cap is rotated into the locked position. The tab and the tooth are edgewise engageable for preventing removal of the cap from the container by rotating the cap in a retrograde or opening direction. The cap is removable from the container only when the flexible tab is moved to the radially inwardly deflected position.

Other objects and features of the present invention will become apparent from the following detailed description considered in conjunction with the accompanying drawings. It is to be understood, however, that the drawings are designed solely for purposes of illustration and not as a definition of the limits of the invention, for which reference should be made to the appended claims. Moreover, the drawings are not drawn to scale and, as such, are merely conceptual in disclosing the preferred embodiments of the invention.

DESCRIPTION OF THE DRAWINGS

In the drawings, wherein like reference characters denote similar elements throughout the several views:

FIG. 1 is a perspective view of an embodiment of the child resistant cap and container constructed in accordance with the present invention;

FIG. 2 is a side view of the cap of the embodiment of FIG. 1;

FIG. 3 is a sectional view of the cap along lines 3—3 of FIG. 2

FIG. 4 is a side view of the child-resistant cap and container of FIG. 1 with the cap in the locked position;

FIG. 4A is a sectional view of the child-resistant cap and container along lines 4A—4A of FIG. 4;

FIG. 5 is a side view of the child-resistant cap and container of FIG. 1 with the cap in an intermediate position;

FIG. 5A is a sectional view of the child-resistant cap and container along lines 5A—5A of FIG. 5;

FIG. 6 is a side view of the child-resistant cap and container of FIG. 1 with the cap in the unlocked position; and